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1970-1971

ANNUAL REPORT

THE GRADUATE COLLEGE

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN



ADMINISTRATIVE STAFF

Daniel Alpert, Dean of the Graduate College

Harold R. Snyder, Associate Dean and Secretary, Research Board

George Hendrick, Associate Dean

George A. Russell, Associate Dean

Vincent I. West, Associate Dean

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EXECUTIVE COMMITTEE OF THE GRADUATE COLLEGE, 1970-71

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JOHN A. QUINN, Ph.D., Professor of Chemical Engineering

JAMES E. ROBERTSON, Ph.D., Professor of Computer Science and of Electrical Engineering

PAUL D. SHAW, Ph.D., Associate Professor of Biochemistry

DAVID S. SHWAYDER, Ph.D., Professor of Philosophy

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MEYER J. WOLIN, Ph.D., Professor of Microbiology



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## I. GRADUATE ADMINISTRATION

A. NEW AND REVISED DEGREE PROGRAMS. During the academic year, the Executive Committee submitted three new degree programs to the Chancellor with favorable recommendations and approved minor revisions in the Master of Business Administration program. The new programs are the Advanced Certificate in Junior College Mathematics Teaching and the Master of Science and Doctor of Philosophy in Atmospheric Sciences.

Advanced Certificate in Junior College Mathematics Teaching. This degree program is designed in response to the expressed needs of the junior colleges to hire and retain qualified teachers with less than a doctoral degree. The program provides a broad background in mathematics, plus a "teaching specialty" in any of a number of mathematical areas, at least two courses in Higher Education, and an internship at a junior college during which the candidate receives supervised teaching experience at both remedial and advanced levels. The title of the program when passed by the Executive Committee was Specialist in Junior College Mathematics Teaching, but the Community College Programs Committee of the Urbana Council on Teacher Education and the Graduate College revised the title, with the concurrence of the Dean and the Department of Mathematics.

Master of Science and Doctor of Philosophy in Atmospheric Sciences. The proposals for these degree programs were submitted by the Graduate College Committee on Atmospheric Sciences (R. O. Simmons, Chairman), which was appointed by the Dean in December 1970 to evaluate and revise the original proposals and to administer the program until an independent department is established. The committee will maintain close cooperation with related research and instructional efforts. Cooperative arrangements on courses and interdisciplinary theses have been made with Electrical Engineering, Physics, and other departments. A strong feature of the program is the success of the Laboratory for Atmospheric Research, directed by Professor Y. Ogura, in attracting highly qualified staff and securing generous non-state support for research activities.

B. LONG-RANGE PLANNING. In the fall of 1970, a committee was appointed to serve concurrently as the Campus Long-Range Planning Subcommittee on Graduate Academic Programs and as the Graduate College Long-Range Planning Subcommittee. The members appointed were:

Ralph O. Simmons (chairman)  
Harold W. Hake  
William J. Hall  
John B. Hanson

John G. Replinger  
Jack Stillinger  
Roger White

The overall objective was "to evaluate the role, mission, funding, and program structure of graduate education on the Urbana-Champaign campus and to consider its relationship to the needs of the state and nation."

In its report to the Executive Committee, the Subcommittee made the following principal recommendations:

1. That responsibility for evaluation and innovation in graduate programs be placed more directly upon the Graduate College Executive Committee and Dean.
2. That the quality of all units be critically reviewed periodically by ad hoc committees authorized to recommend future enrollment and funding levels for the units under review.
3. That University priorities be reordered to insure more adequate support from state funds for graduate education, and that the search for outside funds be strengthened. Further, that the false distinction between graduate education and research be reduced, and that the effects of new modes of undergraduate instruction upon the patterns of graduate student support be studied.

The implementation of the recommendations of the Committee and of related proposals will be studied during the summer by an ad hoc committee to be appointed by the Dean in the late spring or early summer. It is anticipated that the ad hoc committee will present specific proposals for action by early fall.

C. EVALUATION OF ACADEMIC PROGRAMS. A continuing concern of the Executive Committee throughout the academic year was the evaluation of academic programs. The need for a mechanism to evaluate programs and to make use of the evaluations was expressed many times in the context of many different problems confronting the Graduate College, from appointments to membership in the Graduate College to setting goals for graduate education on this campus. It is hoped that actions taken on the basis of the Long-Range Planning Committee's report will be a positive move in this direction.

D. NEW UNITS IN THE GRADUATE COLLEGE. Intended to promote and conduct interdepartmental graduate research utilizing the resources of unusually powerful computers, the Center for Advanced Computation was approved by the Board of Trustees and the Board of Higher Education early in the academic year. Members of the Center's Policy Committee are:

Daniel L. Slotnick, Director  
Robert G. Bartle  
Ralph D. DeMoss  
Joseph E. McGrath

Raymond J. Miller  
Nathan M. Newmark  
Michael S. Sher  
James N. Snyder

Raphael McBain, student member

In October of 1970, the Dean of the Graduate College and the Vice Chancellor for Academic Affairs appointed Professor Benjamin B. Ewing, Professor of Sanitary Engineering in Civil Engineering and of Nuclear Engineering and Director of the Water Resources Center, to be Director of the Environmental Studies Program. Created to provide services for developing interdisciplinary activities related to environmental studies, the Program is the first step

in the development of a more far-reaching organization, the Environmental Studies Institute.

For additional information on these units, see relevant material under Associated Research and Service Enterprises.

E. TEACHING REQUIREMENTS FOR DOCTORAL CANDIDATES. For some time several departments have certified to the Internal Revenue Service that a period of teaching is required for a doctoral degree in their field. The IRS will no longer consider such certification valid until the requirements are approved and appear in the Graduate Catalogue.

Upon the request of some departments that their degree requirements be so validated, the Executive Committee approved a set of guidelines, specifying the form that teaching requirements may take and placing limits upon them. Proposals which conform to these guidelines will be submitted to the Executive Committee at an early meeting.

F. ACTIONS BY THE EXECUTIVE COMMITTEE. Among its other actions during the year, the Executive Committee approved (1) a revision in the Graduate College Catalogue statement concerning residence and credit requirements for the Ph.D. which permits greater flexibility in the second and third stages without diminishing the credit requirement for the degree; (2) a proposal for a procedural change in the limitations on credit for university employees wherein the responsibility for approving underloads is delegated to the departments pending final approval by other administrative offices; and (3) a number of decisions relating to the application of general regulations to specific departmental requests. The Executive Committee also devoted one meeting to a discussion of the Doctor of Arts degree, reaching the conclusion that, at least until there is a significant upturn in the job market, the Doctor of Arts issue is essentially dead. The Committee recommended that the Graduate College not take any general action to encourage proposals to institute Doctor of Arts degrees, but that it should offer support and assistance to any departments that might bring forth proposals independently.

## II. APPOINTMENTS AND AWARDS FOR GRADUATE STUDENTS

Financial aid is provided to graduate students on the Urbana-Champaign campus by appointments as assistants or fellows. Total fellowship support has declined steadily since 1967-68 because of decreases in federal grants for graduate fellowships (Table I), a national trend which has affected all major universities. Even sharper cutbacks are expected in 1971-72 as two major programs, National Defense Education Act Title IV Fellowships and National Science Foundation Traineeships are being phased out.

Federal cutbacks also affect various special fellowship programs on the Urbana-Champaign campus which are supported from funds derived from institutional allowances in connection with federal grants. The total expenditure for graduate assistantship salaries in 1970-71 was more than \$100,000 less than the previous year (Table II).

During a period of declining fellowship support, not only has graduate enrollment increased, albeit at a rate controlled by quotas, but also tuition charges and living costs have continued to rise. The target graduate enrollment figure for 1971-72 is 8,800, an increase of 13.17 per cent since 1967-68.

A. GRADUATE ASSISTANTSHIPS. Research and teaching assistantships are the largest source of support for graduate students on the Urbana-Champaign campus (Tables III, IV, and V). Departments and divisions employed 2,325 teaching assistants and 1,443 research assistants on appointments of one-quarter through three-quarters time. An additional 238 assistants were employed and funded through service-related areas such as counseling, the Dean of Students' Office, and other administrative offices.

B. GRADUATE FELLOWSHIPS. Although fewer in number than assistantships, fellowships and traineeships are important both in recruiting new graduate students and in facilitating the progress of some of the best students already enrolled. Unlike most assistantships, a fellowship allows a student to devote full time to his studies and hasten his progress toward the degree. The declining number of federal fellowships forces increasing reliance on the University Fellowship program. Fellows in residence in 1970-71 are given in Table VI.

### 1. Federally Supported Fellowships.

For a number of years, a high proportion of the fellowships on the Urbana-Champaign campus have been federally supported. If present trends continue, federal fellowships may be virtually non-existent within the next few years, with the possible exception of fellowships in highly specialized programs, many of them in various fields of education. Two major programs which have supported hundreds of graduate students on this campus are being discontinued.

The NSF Traineeship program, which supports students in a wide range of disciplines in the physical and social sciences, is being phased out; no new 12-month traineeships are funded for 1971-72. The number of renewal traineeships, which is 86 for 1971-72, will drop to 44 in 1972-73, to 24 in 1973-74, and to 0 in 1974-75. At its peak in 1970-71, NSF Traineeships supported 128 students. The announced reduction in NSF Graduate Fellowships will not affect the number at Urbana-Champaign for 1971-72 because of continuations and an unexpectedly high number of renewals. Beyond 1971-72, sharp cuts in the program are anticipated.

NDEA Title IV Fellowships, a broadly based program open to Ph.D. candidates preparing for university teaching, have supported students in nearly 50 fields of graduate study at Illinois. The U.S. Office of Education has announced cancellation of the program with no new grants for 1972-73. The number of NDEA IV Fellowships has fallen from 234 at its peak in 1968-69 to 105 in 1970-71. The grant for 1971-72 is for 25 fellowships, plus 6 fellowships designated for students enrolled in the Doctor of Arts Program in Economics. The NDEA IV program will be completely phased out after 1973-74, which is the last year for continuation of the three-year awards which begin next year.

The number of awards in another major program, U. S. Public Health Service Traineeships and Predoctoral Fellowships, is down sharply for 1970-71 -- 269 as compared with 322 the previous year. Indications are that further cuts in training grants which support traineeships and in the nationally-awarded predoctoral fellowships can be expected.

## 2. Fellowships Supported from University Funds.

University Fellowships. University Fellowships, awarded in a rigorous competition, are the nucleus of the fellowship program on the Urbana-Champaign campus. Unlike most federal and industrial programs, University Fellowships are open to graduate students in all fields of study. As Table I shows, the number of University Fellowships has remained the same since 1965-66 when it was increased from 175 to 200. Despite increases in the cost of living in the community, the University Fellowship stipend has remained at \$2,000 for the academic year, plus \$500 for the optional summer session, since 1965-66. Although the University Fellowship is highly prestigious and sought-after, the low stipend, unless supplemented by direct augmentation or an assistantship, may limit its effectiveness in attracting new students to the University.

The campus-wide competition for University Fellowships was modified in 1968-69 when fixed allocations were assigned to selected departments and others remained in an open competition. The awards for University Fellowships for 1970-71 are given in Table VII. The combined fixed allocation and competition system is reviewed annually by the Fellowship Committee. The Graduate College makes recommendations to the committee regarding continuation of the system and adjustments in the fixed allocations and nomination quotas in the open competition. The Fellowship Committee has recommended continuation of fixed allocations combined with the open competition each year since the inception of the system. Currently, an

ad hoc advisory committee appointed by the Dean of the Graduate College is reviewing the policies and procedures for the allocation of all fellowships administered by the Graduate College. The committee will make its recommendations to Dean Daniel Alpert by June 1, 1971.

Stipends for 200 University Fellowships for the academic year have been provided in the Graduate College budget. Supplementary funds have been provided by the Research Board for summer stipends for University Fellowships, a contingency allocation of University Fellowships, and research subvention payments to departments, as well as for several other fellowship programs, as described below (Table VIII).

Graduate College Fellowships. Graduate College Fellowships are awarded to students who could not otherwise be supported in established fellowship and assistantship programs. Financial need is one criterion for selection, and greater weight is given to potential than to past academic performance. Most of the fellows are from minority groups, predominantly American Negroes. Thirty-six Graduate College Fellows were on tenure in 1970-71; the program will be continued at about that level for 1971-72.

University Dissertation Fellowships. University Dissertation Fellowships provide support for outstanding students in the humanities and social sciences, allowing them to devote full time for one year to the preparation of their doctoral dissertations. The Research Board allocated funds for 15 fellowships in 1970-71; ten Dissertation Fellowships have been awarded for 1971-72.

Other fellowships supported from University funds include: (1) 10 Creative and Performing Arts Fellowships awarded on the basis of creative ability and potential, as well as on academic achievement; (2) Illinois College Fellowships and tuition waivers awarded to students nominated by privately supported four-year colleges in Illinois which meet certain qualifications; (3) 80 Summer Fellowships for Teaching Assistants awarded in campus-wide competition to students who have held half-time teaching assistantships the previous year.

### 3. Industrial, Endowed, and Foundation Fellowships.

In addition to the programs supported by University, federal, and state funds, grants for fellowships from industries and foundations represent an important contribution to the development and maintenance of excellent graduate programs in many departments. The number of students on such awards in 1970-71 was 129.

C. TUITION AND FEE WAIVERS. Waivers of tuition and service fees, in addition to those which accompany fellowships, are awarded in a campus-wide competition.

### III. RESEARCH BOARD

A. INTERNAL ALLOCATIONS. The allocations made by the Board during the year ending June 30, 1971, are summarized in six principal categories in Table X. The allocations within each major segment are presented in detail in the numbered subsections of the Table. The changes in the distribution of indirect costs made at the beginning of the year required a substantial reduction in the Board's allocations, which were in total \$2,309,942 for the year ending June 30, 1971, or approximately 77% of the total of the preceding year.

The total of the allocations in behalf of fellowship programs (Section I, Table X) increased slightly, rising to \$478,150 from \$465,150 the previous year. Since fellowship offers ordinarily are made during the year previous to actual payment of the fellowship stipends, it has been the practice of the Board to make advance guarantees of its fellowship support. Accordingly, much of the allocation during the year just ended had been committed for the purpose during the earlier year. With the recent changes in the distribution of indirect costs, other arrangements for the support of fellowship stipends have had to be developed, and at the end of the year 1970-1971 the Board had no outstanding commitments for these stipends. The other large item in this section of the Table is the allocation of \$350,000 for Computer Services operations, to meet part of the costs formerly paid from funds not available during the past year.

The Board has been able to continue its practice of making allocations to departments for assistance in the payment of research computer costs which cannot be supported by external grants or departmental resources. Departments make requests semiannually in behalf of all their staff members and distribute funds allocated among the research programs of their staff members. The allocations to the departments are included in the departmental totals shown in Sections II-VI of the Table. In the year just ended the total of such allocations by the Board was \$293,370. This figure is not to be compared to the total (\$138,400) of the previous year, for during that period the dates of the semiannual allocations were changed from April and October to January and July, to correspond with the halves of the formal fiscal year, so during the year ending June 30, 1970, the Board considered only one set of applications. In the last year (that ending June 30, 1969) in which the Board considered two sets of applications, the total allocations were \$276,276.

The Board received 307 applications (almost the same number as that, 312, of the preceding year) from individual faculty members or small faculty groups for the many kinds of assistance needed in new and continuing research programs. The allocations made in response to these requests are included in the departmental totals shown in Sections II-VI of Table X. Many such requests include stipends of research assistants. The dollar value of such assistantships awarded by the Board is included in the departmental dollar

totals, and the equivalents in terms of full-time assistants at the minimum stipend of \$5,800 for the academic year are shown separately. As has been true for many years, the need for research assistants was largely in the areas of the Humanities and Arts (Section II) and the Social Sciences (Section III).

The total of the allocations in support of faculty research in the various departments (Sections II-VI of Table X), \$1,421,210, dropped somewhat from the corresponding total, \$1,502,799, of the preceding year, with only the Biological Sciences (Section V) showing an increase (from \$291,152 to \$340,830). The largest decrease was in the Physical Sciences (Section VI), from \$567,605 to \$507,699.

Except for the sum of \$1,150 made available to the Board from Graduate College resources, all the allocations listed in Table X were from the Board's accounts.

Members of the Research Board in 1970-71 were:

Daniel Alpert, Chairman	G. A. Leveille
L. Leon Campbell	D. E. Mapother
D. Y. Curtin	H. R. Snyder, Secretary
Ralph T. Fisher, Jr.	Jack Stillinger
W. J. Hall	M. W. Weir

B. REVIEW OF APPLICATIONS FOR RESEARCH GRANTS AND CONTRACTS AND OF GIFTS FOR RESEARCH. Table XI presents a summary of the proposals forwarded to external agencies during the period July 1, 1970, through June 30, 1971, together with the actions that had been taken on the proposals as of the latter date. The number of proposals (1392) issued during the year is the largest to date. Recent corresponding numbers have been 1361 (the previous record) for the year ending June 30, 1968, and 1304 for the year ending June 30, 1969. The resumption of the upward trend in the year just ended, an approximately 7% increase over the preceding year, reflects the continuing strong interest of the faculty in creative work.

Approximately half (711) of the 1392 proposals of the year just ended had received favorable action at the end of the year, resulting in allocations of \$14,300,335, very nearly two thirds of the total requested in these 711 proposals. Only about 10% (136) of the proposals issued during the year had been declined, and 40% of them still await action by the agencies to which they were addressed. These still pending proposals, although only 40% of the total number, account for some two thirds of the total dollar requests, so the actions taken on them will largely determine the success rate for the year.

Table XII presents the current status of the 1304 proposals issued during the year ending June 30, 1970. As of June 30, 1971, 930 (71%) of these proposals had received favorable action, producing grants and contracts of

total value \$32,096,829. This sum is about 5% larger than the total of \$30,496,003 produced as of June 30, 1970, by favorable action on 969 of the 1361 proposals submitted during the year ending June 30, 1969. Many of the changes in amounts awarded in the individual areas, shown in Table XII, as compared to corresponding figures one year earlier, are within the normal year-to-year variations. Changes of more than 20% in the total awards occurred in Administration (up about 50% as of 6/30/71), the Arts (down about 66%), Social Sciences, Applied (up about 30%), Education (down about 25%) and Biological Sciences, Pure (down about 25%). Since only in the past few years have there been even modest awards in the Arts, the sharp decline there is most disturbing.

C. PATENT COMMITTEE. During the past year, the Patent Subcommittee of the Research Board received from staff members 37 disclosures of potentially patentable inventions, most of which were submitted to University Patents, Inc., the patent adviser of the University of Illinois Foundation. The Patent Committee recommended the following actions with reference to the rights of the University of inventions reviewed this year:

Distribution of income . . . . .	3
Assignment to the University of Illinois	
Foundation for further study and possible	
patent application . . . . .	9
Assignment to inventors, subject to the	
rights of any sponsor . . . . .	22
Assignment to an agency outside the	
University . . . . .	3

Members of the Patent Committee for 1970-71 were:

Robert J. Maurer, Chairman	C. C. DeLong, Secretary
Duane H. Cooper	C. Daniel Eaton
James J. Costello	Reid T. Milner
Harold R. Snyder	

D. FACULTY SUMMER FELLOWSHIPS. Faculty Summer Fellowships free younger faculty members to devote full-time to research during the summer months. The fellowships, which are funded by the Research Board, provide a modest tax-free stipend for 60 young faculty members. The awards have made it possible for a number of the fellows to work off-campus in the United States or abroad. The program may have to be curtailed or eliminated for 1972.

Members of the Faculty Summer Fellowship Committee, which selected the fellows for 1971 were:

#### IV. ASSOCIATED RESEARCH AND SERVICE ENTERPRISES

A. BIOMEDICAL SCIENCES COMMITTEE. A Public Health Services Biomedical Sciences Support Grant in the amount of \$133,210 was assigned to the Graduate College Biomedical Sciences Committee. Through the Biomedical Sciences Committee, awards of \$131,710 were made within the framework of the grant's guidelines, namely health-related activities not justifiable under single-project grants, catalysis of new lines of research, and support for campus-wide health-related analytical services utilizing heavy equipment generally not justified by single-project grants. Members of the Biomedical Sciences Committee for 1970-71 were:

R. E. Kallio  
David Gottlieb

Harold W. Hake  
Nelson J. Leonard

B. CENTER FOR ADVANCED COMPUTATION. The Center for Advanced Computation was created early in the academic year 1970-71 in the Graduate College of the University of Illinois at Urbana-Champaign to conduct multidisciplinary and interdisciplinary research on selected problems which generally require special computational resources and to provide services to segments of the academic community and state and federal government.

At the end of this academic year, the Center will complete initial development of a network terminal system. This will provide access to the ILLIAC IV system via the ARPA network which links many of this nation's computer research laboratories. The completion of ILLIAC IV is expected near the end of 1971.

Research pertaining to the use of the ILLIAC IV system continues to be carried out in numerical analysis, information management, and graphical techniques. Several interdisciplinary programs were initiated this year. A natural resources information system (NARIS) is being implemented. In progress is a feasibility study for development of IRIS, a state-wide geographic information system. An information management system was designed and is being implemented for the School of Basic Medical Sciences. A series of large-scale interindustry forecasting models are being developed for manpower, education, and the economy.

The educational services provided through the Center consisted of formal classes and seminars, tutorial and reference documentation, and consultation related to the use of the ARPA network and the ILLIAC IV. In addition, the Center supported over twenty advanced degree candidates in several academic departments.

C. CENTER FOR ADVANCED STUDY. The Center for Advanced Study was established in 1959 to encourage creative achievement and scholarship by recognizing scholars of the highest distinction and by providing incentives for the highest level of scholarly achievement. During the past year the Center has continued to work toward the following goals:

to attract to the campus a greater number of younger scholars and creative artists of outstanding promise,

to bring to the University, for brief or extended periods, distinguished men from both academic and public life who would give students and faculty the benefit of their background and experience,

to sponsor conferences, colloquia, lecture series, and symposia that will stimulate interdepartmental and inter-collegiate intellectual activity, and

to promote frequent interchange of ideas among the faculty, student body, and outside visitors.

Beginning in September 1970, the Center for Advanced Study sponsored a project to make the teaching of the humanities more responsive to the needs of students in the university and in the educational process at all levels. In its first year, the Humanities Group focused its attention on the following interrelated topics: (1) the humanities, arts, and technology; (2) the preparation of teachers of the humanities; and (3) the contribution of the humanities to interdisciplinary courses and programs in the university. The result of the interest thus engendered was the establishment of Unit One, an experimental residential college scheduled to open at Allen Hall in September 1971. While the Humanities Group has been so metamorphosed it will continue to have informal connections with and support from the Center during the coming year.

Professors in the Center were: John Bardeen, Professor of Electrical Engineering and Physics; Joseph L. Doob, Professor of Mathematics; Harry G. Drickamer, Professor of Chemical Engineering and Physical Chemistry; Henry R. Kahane, Professor of Spanish and Linguistics; Nelson J. Leonard, Professor of Chemistry; Oscar Lewis, Professor of Anthropology; Charles E. Osgood, Professor of Psychology and Research Professor in the Institute of Communications Research; Charles P. Slichter, Professor of Physics; Jack Stillinger, Professor of English; Michio Suzuki, Professor of Mathematics; and Ledyard R. Tucker, Professor of Psychology and Educational Psychology.

Associates for 1970-71 were: Jack A. Adams, Professor of Psychology; John C. Bailar, Jr., Professor of Chemistry; Max Beberman, Professor of Secondary and Continuing Education; Hans J. Brems, Professor of Economics; Edward M. Bruner, Professor of Anthropology; Gerald L. Exline, Professor of Architecture; Philipp Fehl, Professor of the History of Art; Peter Hay, Professor of Law; Thomas A. Krueger, Associate Professor of History; Edward E. Lancaster, Assistant Professor of Art; Edwin London, Professor of Music; Dillon E. Mapother, Professor of Physics; Salvatore Martirano, Associate Professor of Music; Alberto Porqueras-Mayo, Professor of Spanish; Nicholas M. Temperley, Associate Professor of Music; Carl R. Woese, Professor of Microbiology; Peter E. Yankwich, Professor of Physical Chemistry; Ladislav Zgusta, Visiting Professor of Linguistics; Reiner T. Zuidema, Associate Professor of Anthropology.

Thirteen Fellows were appointed to the Center for the 1970-71 academic year. Fellowships are awarded in open competition to young men and women of the

highest intellectual excellence and creative promise and enable the Fellows to pursue independent work in all of the social and natural sciences, the humanities, and the creative arts. Fellows were: Barton J. Bernstein, Associate Professor of History, Stanford University; David K. Campbell, Ph.D., University of Cambridge; Edward Friedman, Assistant Professor of Political Science, University of Wisconsin; Georgia M. Green, Teaching Fellow in Linguistics, University of Michigan; Michael S. Harper, Associate Professor of English, California State College at Hayward; Oliver W. Holmes, Instructor in History, Stanford University; Robert L. Holmes, Associate Professor of Philosophy, University of Rochester; Grzegorz Kowalski, Assistant Professor of Sculpture, Warsaw Academy of Fine Arts; Karl K. Merker, Lecturer, Designer and Printer, University of Iowa; Graham A. Nuthall, Senior Lecturer in Education, University of Canterbury; Robert M. Ray, Master of Regional Planning, University of North Carolina; Paul G. Schmidt, Ph.D., Stanford University; Wolf S. Wagner, Assistant Director at the Deutsche Schauspielhaus, Hamburg, Germany.

Members of the Steering Committee for 1970-71 were:

Richard H. Green, Acting Director	Jack McKenzie
John Bardeen	Richard Merritt
John J. Bateman	Robert Nelson
Harry Broudy	David Pines
Warren Doolittle	Glenn Salisbury
Hugh Folk	A. R. Williams

D. CENTER FOR HUMAN ECOLOGY. A problem-oriented center carrying out both teaching and research, the Center for Human Ecology is concerned with such matters as population, population patterns and migration, the relationship between man and his environment, environmental health, pollution, and food, water, and air supply. These subjects have been of increasing national, state, local, and student concern.

Human Ecology 369, "Introduction to Human Ecology," and Human Ecology 374, "Problems in Human Ecology," were offered this past year. Both are cross-listed in 7 departments. At present the Center is empowered to give graduate training leading to the M.S. degree. During the coming period a program of graduate training in human ecology and environmental health science will be under development.

A translation of the standard Russian textbook in ecology by N. P. Naumov, Ekologiya Zhivotnykh (Animal Ecology), edited and prepared for publication by the Center, is now in press at the University of Illinois Press. Its publication is assisted by a grant from the National Library of Medicine, National Institutes of Health, Bethesda, Maryland. A textbook in human ecology is in preparation. It should be finished next year.

The primary research project for 1970-71 had to do with the ecology of populations migrating from Holmes County in rural Mississippi to the Mile

Square area of Chicago. A search for the cause of eosinophilia (increase in proportion of a type of white blood cell) in children in the Holmes County Head Start program, which was discovered during the previous year, is being made.

Members of the Executive Committee for 1970-71 were:

Norman D. Levine, Chairman and Director	
Charles S. Alexander	Richard S. Engelbrecht
W. Randolph Boggess	S. Charles Kendeigh

E. CHILDREN'S RESEARCH CENTER. Composed of a number of interdisciplinary laboratories directed by faculty members from several disciplines, the Center carried out this year an even greater variety of collaborative projects with numerous governmental and local agencies in a number of locations throughout the State of Illinois.

Many of these projects are carried out jointly with the Department of Mental Health of Illinois. The projects are located at Adler Zone Center, Champaign; Lincoln State School, Lincoln; and the Institute for Juvenile Research, Chicago. Professor Warren M. Steinman directed the fourth year of a behavior modification project for severely behaviorally disturbed children at Adler Zone Center.

The fifth year of operation of the joint Center and Lincoln State School Laboratory at Lincoln State School was completed. The Laboratory is directed by Professor Keith G. Scott from the Center and Mr. William Overton of Lincoln State School. The Laboratory is devoted to studies of learning and development of mentally retarded children and adults. In the past year continued research emphasis was given to learning of a cognitive nature in the mentally retarded. An automated version of an intelligence test was used, and a variety of other projects related to student theses were conducted.

This is the first year of operation of a Psychopharmacology Project in cooperation with the staff at the Institute for Juvenile Research in Chicago. A comprehensive survey of the type of psychotropic drug prescribed by practicing pediatricians, psychiatrists, and neurologists in the greater Chicago area was conducted. National concern over the use of psychotropic drugs with school children makes this study particularly pertinent.

The Motor Performance and Play Research Laboratory in the Center had a productive research year. In addition to the main interest--bio-energetics of play, analysis of activity patterns in free-ranging children, and the social aspects of the acquisition of motor skills--the Laboratory increased active cooperation with the Psychopharmacology Project. The Tinley Park Hospital in the Chicago area was among the settings in which the Laboratory increased its research.



areas and other environmental resources for instructional purposes. Brownfield Woods is receiving special attention in this program.

The Phillips Area, obtained by the University in 1968, has proven a valuable research asset. Some twenty research projects have been undertaken on the area to date.

It has become evident that if the University is to meet its obligations in basic ecological research in this period of environmental crisis, additional research and teaching resources will be required. During the past year, the Committee submitted a proposal to the University administration to acquire approximately 1600 acres in the vicinity of Brownfield Woods and Trelease Woods at a cost of about \$1,500,000. This sum includes paying off the bank loan obtained for acquiring the Phillips Tract. If this area can be acquired it will be divided into plots for experimental manipulation of environmental factors and for restoration of adequately sized areas of tall-grass prairie and forest-edge, such as were present in primitive times. This will allow assessment of changes in the environment since the advent of man, evaluation of environmental quality as it was originally, the investigation of ecological processes as they have developed through evolution, and the application of these processes to human welfare and advantage. Hopefully, action can be taken on this proposal in the near future.

Members of the Committee during the past year were:

S. Charles Kendeigh, Chairman	Alan W. Haney
Fakhri A. Bazzaz	William R. Horsfall
William R. Boggess	Joseph A. Jackobs
Roger K. Brown	Glen C. Sanderson
Joe B. Fehrenbacher	Hurst H. Shoemaker
Lowell L. Getz	Gilbert P. Waldbauer
Alvan R. Gilmore	Mary F. Willson

G. COMPUTER-BASED EDUCATION RESEARCH LABORATORY. The PLATO system has provided 1,787 class hours of credit teaching in 51 courses during fiscal year 1970-71. These courses were taught in the laboratory classroom at CERL and at the four demonstration classrooms in Champaign-Urbana. The subjects taught included chemistry, French, Russian, Latin, biology, physics, political science, economics, statistics, maternity nursing, pharmacology, elementary mathematics, and veterinary medicine.

TUTOR, the author language for PLATO, has continued to provide a very powerful and flexible tool for lesson and systems software development. As a result, lesson development has been expanded substantially and lessons in an increasing number of new subject areas are currently in progress.

The four demonstration classrooms continued to operate. The classrooms are located at Washington School, Champaign; Parkland College; Mercy Hospital School of Nursing; and the University of Illinois' School of Life Sciences.

Currently, the principal objective of CERL is the implementation of PLATO IV, a large-scale computer-based education system. This system will eventually be capable of serving several thousand student terminals at various education institutions within a 150-mile radius of Urbana-Champaign. A major task is the development of an inexpensive and flexible teaching console.

In August of 1970, a Control Data Corporation 6400 computer and associated peripheral equipment, plus 250,000 words of extended core storage were installed. This computer will be capable of handling the first 1000 of the 4000 terminals of the PLATO IV system. Since the arrival of the new computer, software development has been accelerated.

In the spring of 1971, a production contract was awarded to Magnavox for the first ten PLATO IV terminals.

The design has been completed for the communication equipment which will be used in the PLATO IV system, and construction is presently underway.

A proposal for a four and one-half year experimental project using PLATO IV has been submitted to the National Science Foundation.

H. DEPARTMENT OF COMPUTER SCIENCE. The following comparison shows the rapid and significant growth of the teaching and educational phases of the Department of Computer Science.

	<u>1970-71</u>	<u>1969-70</u>	<u>1968-69</u>	<u>1967-68</u>
Students enrolled in introductory computer courses (C.S. 101, 103, 105, 107, 109, 121, 199, 400)	3,417	2,813	2,178	1,692
Students enrolled in other departmental courses	2,210	2,090	1,815	1,431
Students enrolled in the Mathematics curriculum with Computer Science minor	367	306	289	218
Students enrolled in graduate program	141	134	134	73
Students awarded the M.S. degree *other departments	20 (4)	26	27	2
Students awarded the Ph.D. degree *other departments	9 (6)	4 (4)	0 (4)	1 (5)
Graduate assistants employed	92**	119	130	101

\* Degrees conferred in other departments, but work done in Computer Science.

\*\* The apparent reduction is due to the fact that a substantial number of Computer Science graduate students are employed in the Center for Advanced Computation which for the first time this year is separately reported.

During the past year, the Department actively supported the setting up of the ILLIAC IV Project as an independent Center for Advanced Computation and the separation of the service activities of the Department, which have become the Computing Services Office. The Department itself has hence moved into a position to direct its primary thrust toward further development and strengthening of the research and educational aspects of the newly emerged discipline of computer science.

Much in this direction has been accomplished during the past year; three examples will suffice to illustrate this point. First, a baccalaureate program in computer science to be administered through the College of Engineering has been formulated and is part way through the lengthy approval process. Second, because computer science is a rapidly evolving discipline, it is mandatory that a reassessment of the Department's involvement in and coverage of the discipline should be undertaken much more often than might be the case in other disciplines. To accomplish this objective approximately six subdisciplinary committees have been appointed to examine recent developments within the subdisciplines and to compare these with the current course offerings. As a result, the coverage of the discipline is being repackaged by setting up new courses, by revising some, and by abandoning others. The next stage, to be initiated next year, will involve a reexamination of departmental graduate programs. Third, the Department has begun to press forward in a coordinated effort with other departments and colleges toward widening and deepening the Computer Science educational offerings available to other disciplines. This effort will be continued and intensified during the coming year with particular attention being paid to the areas represented in the College of Commerce and Business Administration and in the College of Education.

Three major groups within the Department are supported by the Atomic Energy Commission.

1. In the software research group, an initial version of a very general modeling simulation system has been completed and is operational on two interactive graphic display terminals. Supporting graphic software also makes it possible for general 360 users to do interactive graphic input output.
2. In the hardware research group, the last year saw the completion of one of our major projects, namely the stochastic picture processor TRANSFORMATRIX. The machine is the world's largest parallel computer, having 1,024 arithmetic units performing simultaneous matrix multiplications! Another project of great interest is EIDOLYZER, which analyzes colored landscapes by decomposing them into a series of horizontal bands and using a "dictionary" (called World Model) which gives the correspondence of colored band sequences to element names like "sky," "water," etc. Great progress has been made on the 3-dimensional laser display, STEREOMATRIX, which is about 80% complete.

3. ILLIAC III is an experimental computer under final construction by the Department of Computer Science as a first instrument to explore the potentialities of high-speed image processing. Concurrent with the computer design work, this contract supports research into the theory of image processing.

Major hardware accomplishments this past year include: initial operation of the Scan/Display Center with communication of a dedicated PDP8/e to the IBM 360/75, and initial operation of the Pattern Articulation Unit - the parallel processor of the machine for image analysis.

Several groups are supported by the National Science Foundation:

1. The first phase of the design and implementation of the array language, called OL/2, has been completed. Many interesting array algorithms can now be written in this high-level language and executed on the IBM 360.
2. The general nature of the research in digital computer arithmetic was the use of representations of numbers other than positional notation for the development of efficient hardware algorithms. Extensions were made to previous work employing continued products for evaluation of the logarithm, exponential, trigonometric, and inverse trigonometric functions. Some initial studies of continued fractions were also made.
3. Logical design of optimal digital networks by integer programming has been continued. Optimal networks (the minimum number of gates or the minimum number of levels) are designed with different types of gate or their mixture. Optimum adders are also designed. The branch-and-bound method which is an algorithm for integer programming is improved, introducing new gimmicks.
4. Further development of the tree processing language NUCLEOL was carried out.
5. Work has also proceeded in the following areas: polynomial approximation theory, factorization methods for discrete elliptic partial differential operators, numerical methods for stiffly stable ordinary differential equations, an enumeration method for finding all trees in a graph, optimal decision trees, evaluation of polynomials in a given number of arithmetic steps, an analytical intersection detection procedure for polyhedral objects, automatic theorem-proving algorithm for higher than first-order logical systems, numerical quadrature schemes, numerical methods for solving

Volterra integral equations on parallel processors, and numerical methods based on piecewise polynomial approximations for solving first-order hyperbolic systems. A study of clustering techniques to classify a collection of American Indian pottery fragments.

6. A new project was undertaken whose goal is the development of analytical tools for system modeling and analysis of real-time computer networks. The particular network being investigated is that of a geographically distributed network of computers. A queueing theory model for this computing system based on the essential characteristics of the network, and priority assignment rules for efficient job processing at each of the computing centers of the network is being investigated.

As a concrete test case, we will be focusing our attention on Illinet, a geographically distributed computing center which provides online express, teletype timesharing, and remote batch entry services to a network of users at the University of Illinois. Based on the essential characteristics of the various computers within the center, we shall employ our queueing theory model to facilitate studying the effects of priority assignment and job dispatching.

7. Another new project involves the study of computer systems and software design. In particular, work will be carried out on problems of parallelism in programs, memory hierarchies, and processor organization. To aid in this work, we were fortunate to have been given a microprogrammed machine by the Burroughs Corporation, and funds from the Research Board for peripheral equipment for this machine.

Early in 1971, the Department purchased a PDP-11 minicomputer with 8K of 16-bit words, a one-half megabyte head per track disc and some peripherals. This has been the principle computer used by C.S. 201, Machine Language and System Programming, I, students this semester.

A noteworthy feature of this course has been the supervised homework sessions of four hours per week in which groups of 10-16 students write programs, discuss problems, ask questions, and receive a considerable amount of advice and helpful criticism from their teaching assistant or grader. As well as the more formal aspects of the course, we stress continuous ample documentation, prior planning and clean code. Most students do a term project of their choosing--singly or in groups.

Two continuing functions performed by SOUPAC (Statistically Oriented Users Programming and Consulting) members are aiding research persons to use the computers (about 20 to 40 consultations per day) and extending and improving the SOUPAC package of programs. Seven completely new procedures were added,

and the system itself was improved resulting in less cost to the user by reducing the number of I/O requests and by allocation of the core dynamically to provide for optimal matching of data to region size. The counter in the system indicates on the average that there are about 2,600 references to SOUPAC per month.

In addition to occasional lectures in formal classes on the use of SOUPAC, a non-credit night course for six weeks (2 hours per week) with about 50 enrollees was conducted during the first semester. This course was repeated during the second semester for eight sessions with about 80 enrollees.

Since SOUPAC was developed at public expense, its public use has not been discouraged. A complete SOUPAC is now operational at the following computer installations:

University of Ottawa, Ottawa, Canada  
Cleveland State, Cleveland, Ohio  
University of Nebraska, Lincoln, Nebraska  
University of Miami, Coral Gables, Florida

In the area of educational and research computer service, during the period July 1, 1970 through April 30, 1971, 594,899 jobs were processed by the IBM 360 installation. (Of these, approximately 63% were class runs.)

At the beginning of July 1970, two new elements were introduced into the 360 software system. HASP replaced ASP as the monitoring system and an EXPRESS monitor was introduced to the system. An additional card reader, additional high-speed core, an extra drum, and five extra disk drives increased the hardware's functioning ability. These additions were added to the ability of the system to handle the increased job load with no noticeable impact of job turnaround time.

Of the total accountable time (2,313 hours of central processor time), 920 hours (39.8%) were used for class problems, 417 hours (18.0%) were used for thesis research, 696 hours (30.0%) were used for non-thesis research, 278 hours (12.0%) were used for administration and development and two hours (0.1%) were used for special short runs.

Total runs made on the 360/50-75 computer during the period of July 1, 1970 - April 30, 1971, shows an increase of 77% over the previous period of July 1, 1969 - April 30, 1970.

On October 21, 1970, the service area of the Department of Computer Science officially became a separate administrative unit called the Computing Services Office. Projected CSO plans for the coming year will require little expansion in either personnel or hardware equipment. Rather, the year will be devoted to an intensive reexamination and analysis of all aspects of the services offered by CSO. Attention will be concentrated on the software system. Measurement and evaluation of the capacity of the system and improvements that can be made to increase the services offered to campus users will be the primary goal of CSO for the year.

I. ILLIAC IV PROJECT. The goals of this project are the completion and acceptance of the ILLIAC IV hardware and the production of the initial system software. The hardware is currently in the final assembly stage. Burroughs Corporation is manufacturing and integrating the system. System integration should be complete by late fall, and acceptance testing underway at the construction site in December.

The initial system software will be completed in late summer, but quality assurance, incorporation with the hardware, and initial enhancement will continue through winter of 1972.

During the past year the sponsoring agency selected NASA Ames Research Center as the permanent host installation to operate the ILLIAC IV. Through a subcontract with Burroughs, the project will operate and maintain the system at the construction site for a few months following the system acceptance. The machine will then be shipped to Ames, and NASA will assume full responsibility for the system.

J. ILLINOIS HISTORICAL SURVEY. The Illinois Historical Survey Library is engaged primarily in acquiring materials relating to the history of Illinois and in making those sources available for research use on the part of students, scholars, and the general public. Again this year several writers of doctoral dissertations have made extensive use of the Survey Library's holdings, and numerous seminar and term papers have been written, in whole or in part, from its collections. A much larger body of students have made more casual use of the Library's resources.

The number of requests for interlibrary loan service grew during 1970-71, and the number of written requests for information and for reference service increased sharply.

The Survey Library's book collection now numbers 5953, following the acquisition of 261 volumes during the past year. In addition, 44 new manuscript collections were processed, notable among them being the papers of Charles Smith Hamilton, who was involved in both the Mexican and the Civil Wars; those of Arnold Henry Dohrman, engaged in international trade during the late 18th and early 19th centuries; the Pease-Lyman family papers; and the records of the Central Illinois Chapter of the American Institute of Architects. Additions were made to the records of the American Fur Company, to the correspondence of Joseph G. Norwood, and to the papers of the Indian Claims Commission.

Work continues on the Survey's publication 7, which will reflect the holdings of the Survey Library in the form of manuscripts, maps, newspapers, vertical file material, and finding aids.

Unexpected new duties accompanied preparations for the filming and subsequent publication, scheduled for this summer, of the nearly 300,000 card Mereness Calendar. As a result, other projects have been temporarily set aside in order to provide time to check the Calendar's contents and replace the few missing cards prior to filming.



Sciences on the needs and the design of animal facilities. In addition, time was devoted to advising architects as to the design of the proposed Research Animal Holding Facility.

A great deal of time has been devoted to improving the conditions of animal care in those areas which have been consistently most deficient. The pilot program centralizing administration of animal care in the College of Veterinary Medicine has been successful and continues to expand with voluntary participation by increasing numbers of investigators. The per-diem costs of maintaining the various species of animals currently involved in the centralized laboratory animal care in that college are being determined.

The office has studied the impact of the Animal Welfare Act of 1970, which amends the existing Laboratory Animal Welfare Act and which will go into effect December 24, 1971. The new law differs from the present law in that additional species of warm-blooded animals are included, and the new law also covers conditions for housing and care throughout the animal's stay in the research facility. The earlier act covered a limited number of species of mammals and confined the surveillance authority of the Secretary of Agriculture to periods when animals were not involved in research. The new act, however, provides a specific prohibition against interference with the design or the execution of the experiment. The new act further provides that the research institution shall be responsible to see that experimental procedures are conducted in accord with professionally acceptable standards. There is no doubt that the new law will be an additional expense to the departments housing additional species of animals that will come under control of the act as well as additional expense and labor in the Office of Laboratory Animal Care for carrying out the inspection process. It is likely that many functions will require renovation and improved animal quarters in order to meet the requirements of the new act. Because of the tight budget situation and the increased cost of compliance with the new act, efforts must be directed to better utilization of manpower and standardization of care procedures.

Personnel of the Office taught a course in the management and diseases of laboratory animals. The office sponsored a campus-wide seminar entitled "A University Resource in Laboratory Animal Medicine" given by Dr. Bennett J. Cohen, Director of the Unit for Laboratory Animal Medicine, University of Michigan Medical School, Ann Arbor, Michigan.

Research endeavors continue in the general area of laboratory animal medicine and the continuing search for animals which may serve as suitable models to study diseases which plague man and animals.

M. RADIATION HAZARDS COMMITTEE. 1970-71 was a relatively static year for the radiation safety program and the use of radiation sources on the Urbana-Champaign Campus. In purchases of radioisotopes, a total of over 15,000 millicuries in 724 orders was distributed among 18 departments (compared with about 16,000 millicuries in 691 orders last year).

Production of radioisotopes at the Nuclear Reactor Laboratory increased substantially to over 152,500 millicuries in 1130 samples (compared with 222 millicuries in 581 samples last year). About 152,000 millicuries of this was short-lived Sodium-24 produced for a commercial off-campus user whose former source of supply was cut off by the lengthy shutdown of two irradiation facilities at Argonne.

The number of rooms (radioisotope laboratories and storage areas) on the present routine survey list is about 270. No major new radiation facilities came into existence this year, although the Microtron project at the Betatron Laboratory has progressed to the point where it has produced significant amounts of radiation on several occasions.

Some 250 regularly assigned film badges were issued biweekly to monitor personnel radiation exposures this year. There was one reported over-exposure (12,970 millirem) which exceed the permissible limit for skin (7,500 millirem) for a calendar quarter. It resulted when a graduate student was exposed to soft x-ray for several seconds after detaching some equipment from in front of the open beam port of an x-ray diffractometer. The closest thing to a major spill of radioactivity this year was the blow-out of a viewing port on apparatus containing a Polonium-210 alpha source. However, the source integrity was sufficiently good that no radioactivity was detectable in the laboratory other than a small amount on the port fragments.

The purchase of eight new lasers was reported this year, bringing the total of laser installations on this campus to 94.

The Health Physics Staff consists of three full-time Health Physicists, one full-time technician, and part-time student help.

Members of the Radiation Hazards Committee for 1970-71 were:

John P. Hummel, Chairman	Lawrence M. Hursh
James S. Allen	Robert F. Nystrom
Howard S. Ducoff	Jerome J. Steerman
Lester E. Elliott	Joseph T. Verdeyen
Alfred O. Hanson	Philip J. Voegtle

N. WATER RESOURCES CENTER. The Water Resources Center was organized in 1963 to encourage the development of interdisciplinary research and graduate education in water resources. Its program has been characterized by a steady rate of growth, by involvement of a wider spectrum of disciplines on the campus, and by expansion to more and more universities in the State of Illinois. The Center has, since 1964, been responsible for administering the Water Resources Research Act Program for the entire State of Illinois.

In the program for the 1970-71 academic year, twelve projects were funded out of the annual allotment from the Department of the Interior, and twelve

projects were supported by matching-grant funds from the Department of the Interior. In addition, there were six projects which were funded entirely from the Water Resources budget from the Graduate College. The total budget of the Water Resources Center for this year is \$570,000; this was provided by \$85,000 in funds from the Graduate College; \$202,000 in contributions from other departments and State scientific surveys and from indirect costs foregone. It also included \$100,000 in the Federal allotment and \$183,000 in Federal matching funds. This represents an eleven percent expansion of the program over last year.

The program of the Water Resources Center has supported a total of 31 staff including members in ten of the academic departments on the campus and in all three of the state scientific surveys. The staff also includes members from one department at Southern Illinois University, two departments at the University of Illinois at Chicago Circle, and one department at Northwestern University.

In February of 1971, an assistant director (Harry G. Wenzel, Assistant Professor of Civil Engineering) was added to the administrative staff of the Center. In addition, efforts are under way to reorganize the State-Wide Advisory Committee to include broader representation, including the three agencies established under the 1970 Illinois Environmental Protection Act.

Members of the Executive Committee for 1970-71 were:

George W. White, Chairman  
William C. Ackermann  
Benjamin B. Ewing

John C. Frye  
Ross J. Martin  
G. W. Salisbury

O. INTERDEPARTMENTAL COMMITTEES IN RESEARCH AREAS.

1. Atmospheric Sciences and Meteorology.

This committee has had the responsibility of generating a proposal, submitted during the year to the Chancellor with favorable recommendation, for a new program leading to the M.S. and Ph.D. in Atmospheric Sciences. It is proposed that these degrees be offered under the auspices of the Committee pending the formal establishment of an independent department.

2. Cognitive Studies.

The Committee on Cognitive Studies was established to explore common interest in cognitive studies on this campus; to encourage innovative work in this field, including the preparation of proposals to various funding agencies for research support; and to examine the feasibility of the development of an interdepartmental program in graduate research. The Committee has processed several research grants and has also sponsored one seminar on cognitive studies (125 students, crosslisted in six departments), and one laboratory course in cognitive behavior (about twelve students).

3. Comparative Pharmacology and Toxicology.

The Committee on Comparative Pharmacology and Toxicology is devoting its efforts to formulating a proposal for an interdepartmental graduate program in this field and to study the feasibility of establishing a Faculty of Comparative Pharmacology and Toxicology on this campus.

4. Environmental Studies Program.

The Environmental Studies Program, established within the Graduate College, is an organizational unit created to provide services for developing interdisciplinary activities related to environmental studies including teaching, research, and public service. The ad hoc Committee on the Environmental Science Program has recommended development of a more far-reaching organization, the proposed Environmental Studies Institute. The Institute has been approved by the Senate of the Urbana-Champaign Campus and Chicago Medical Center and is under consideration by Chicago Circle Campus.

In the interim, the Environmental Studies Program is providing support for interdisciplinary activities in the environmental area. The Dean of the Graduate College and the Vice Chancellor for Academic Affairs appointed, in October 1970, Professor Benjamin B. Ewing, Professor of Environmental Engineering in the Department of Civil Engineering and of Nuclear Engineering and Director of the Water Resources Center, to be Director of the Environmental Studies Program. In the Spring of 1971, Professor John E. Pearson, of the Departments of General, Civil, and Nuclear Engineering, was appointed Associate Director of the program for liaison with state agencies and public service.

During the past year the program has administered the study of Environmental Pollution by Lead and Other Metals funded by the National Science Foundation. Progress with this study has indicated the importance of development of a more extensive study of heavy metals in the environment. The Heavy Metals Task Force which is conducting this study includes, in addition to Urbana-Champaign personnel, faculty from the Chicago Medical Center and the Chicago Circle Campus. In connection with the study of lead pollution, an analytical laboratory facility has been established in the Environmental Research Laboratory on the Urbana-Champaign campus. The laboratory has two full-time professionals assisted by graduate student research assistants and technicians. The lead study has required an extensive review of the literature to ascertain present knowledge and has in turn contributed to the preparation of a state-of-the-art report on environmental lead for the Institute for Environmental Quality of the State of Illinois.

Several other interdisciplinary programs are being explored for their potential or are being organized now as part of the Environmental Studies Program. These include:

Plant Nutrients as Environmental Pollutants  
Beneficial Uses of Waste Heat  
Behavioral Aspects of the Environment

Air Pollution from Stationary Sources  
Noise as an Environmental Problem  
Ecological Impact of Modification of the Sangamon River Basin  
by the Oakley Project  
Animal and Human Metabolic Wastes  
Plant Residues and Food-Processing Wastes  
Erosion and Sedimentation  
Human Interaction with the Physical Environment  
Decision-Making Related to Environmental Quality.

It is hoped that several of these problem-oriented interdisciplinary studies will be started and will then become task forces in the Environmental Studies Institute when it is established.

#### 5. Housing Research and Development.

The interdisciplinary Committee on Housing Research and Development has as its goal the formulation of proposals for educational activities in the broad area of housing needs for persons of low and moderate income. At the start of the academic year, the Committee assumed responsibility for several research/public service contracts that had been initiated in the Department of Architecture. These projects included a cooperative investigation with the Rockford Public Housing Authority to determine levels of satisfaction among occupants of a housing project through the development and testing of various techniques for matching behavior and environment; and a cooperative investigation with the Cook County Office of Economic Opportunity and the HOME Housing Development Corporation to explore alternative roles, assess the effectiveness of current programs, and provide technical assistance in housing development. Efforts are also being made to establish productive relationships with campus and governmental agencies concerned with housing.

#### 6. Photography and Cinema Studies.

This committee has been working to initiate and give general direction to cinema studies on this campus, to explore possible educational activities and academic structures for carrying out such activities in photography and cinema studies, and to formulate recommendations for their implementation. In addition, the committee will seek to encourage innovative work in photography and cinema studies through preparation of proposals to various funding agencies for support.

## V. SUPPORT FOR SCHOLARLY PUBLICATIONS

A. PUBLICATIONS BY THE UNIVERSITY PRESS. The University Press is responsible for developing and conducting the University's publishing program of scholarly books and journals. Since it was established in 1918, the Press has published more than 1000 scholarly and scientific books. The great majority of these works have appeared in the last two decades, with 500 titles currently available and listed in the 1970 catalog of Books in Print.

For the period covered by this report the Press published 53 books and 7 quarterly journals (28 numbers). Although less than 6% of Press income comes from Graduate College funds, the support provided is valuable in gaining a hearing for authors whose works have importance and quality but may lack the market appeal required for commercial publication.

Following is a complete listing of University Press publications for the preceding year, including all general titles, four series of monographs, seven journals, and a paperback series of Illini books.

Members of the University Press Board for 1970-71 were:

George Hendrick, Chairman	Winton U. Solberg
A. Lynn Altenbernd	A. V. Wolf
Robert D. Katz	J. B. Wolf
Miodrag Muntyan, ex officio	

Members of the Committees for the University Studies Series for 1970-71 were:

Biological Monographs:

Philip W. Smith, Chairman	Tom L. Phillips
Donald F. Hoffmeister	Richard B. Selander
Willard W. Payne	

Monographs in Anthropology:

Harold A. Gould, Chairman	Frederic K. Lehman
Charles J. Bareis	Norman Whitten
David Grove	

Studies in Language and Literature:

Burton A. Milligan, Chairman	Philip Kolb
John J. Bateman	Angelina Pietrangeli
Allan Holaday	

Studies in Social Sciences:

Robert W. Harbeson, Chairman	Robert M. Sutton
Robert E. Scott	

B. ANNUAL LIST OF PUBLICATIONS OF THE FACULTY. The listing of scholarly and professional publications by faculty and administration is once more of substantial length, with over 4,000 faculty members from the Urbana and Chicago campuses entering one or more titles. The Graduate College at Urbana-Champaign coordinated the all-University publication.

C. ILLINOIS JOURNAL OF MATHEMATICS. This journal is published quarterly under the auspices of the Graduate College. Since June 1970 the Journal has received 108 papers from eight countries, including the United States. Sixty-five papers, amounting to 709 pages, were published during the year. Circulation now stands at 1061, an increase of about 5% over last year's circulation of 1011.

Members of the editorial board for 1970-71 were:

Mahlon M. Day, Chairman  
Mary-Elizabeth Hamstrom  
Harry Kesten

Arunas Liulevicius  
Hans Samelson  
John H. Walter

D. JOURNAL OF ENGLISH AND GERMANIC PHILOLOGY. This journal is published quarterly under the auspices of the Graduate College. The four issues of the most recently completed volume, that for 1970, contained a total of 726 pages comprising 34 articles and 121 book reviews.

Members of the editorial board for 1970-71 were:

Jack Stillinger, Chairman  
Richard H. Green  
Dale V. Kramer

P. M. Mitchell  
Ernst Alfred Philippson

Table I

## Comparison of Fellowship Support

1965-66 through 1970-71

Year	Graduate Enrollment	All Fellows in Residence	Federally-Supported Fellows	NDEA Title IV Fellows	NSF Trainees	U.S. Public Health Service Trainees and Fellows	University-Supported Fellows	University Fellows
1965-66	7,078	1,008	685	92	*117	227	204	200
1966-67	7,347	1,203	856	165	*105	268	214	200
1967-68	7,639	1,404	1,008	227	126	295	253	200
1968-69	7,494	1,341	964	234	114	301	244	200
1969-70	8,459	1,317	887	170	126	322	277	200
1970-71	8,465	1,267	826	105	128	269	289	200

\*Includes cooperative fellows, a program since discontinued.

Table II  
COMPARISON OF AMOUNT OF FINANCIAL AID  
1966-67 -- 1970-71

<u>Year</u>	<u>*Total for Assistantships</u>	<u>Total for Fellowships</u>	<u>Fellowships plus Assistantships</u>
1966-67	\$ 7,914,890	\$ 3,241,073	\$ 11,155,963
1967-68	8,159,642	3,963,325	12,122,967
1968-69	9,600,383	3,860,043	13,460,426
1969-70	10,535,840	3,738,548	14,274,388
1970-71	10,423,876	3,661,847	14,085,723

\*Assistantships from 25 to 75 percent time employed by departments and divisions

TABLE III

SOURCE OF FUNDS FOR FELLOWSHIPS<sup>a/</sup>

1954, 1958, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970

YEAR	University	Industrial, Endowed, and Foundations		Federal and Other		TOTAL
		Amount	Percent of Total Aid	Percent of Total Aid	Amount	
1954	\$115,975	50.0%	\$105,483	45.5%	\$ 10,400	4.5% \$ 231,858
1958	246,000	40.1%	225,900	36.8%	141,545	23.1% 613,445
1963	391,365	24.7%	266,156	16.8%	926,090	58.5% 1,583,611
1964	430,050	21.5%	301,598	15.1%	1,271,121	63.4% .2,002,769
1965	475,400	18.8%	258,715	10.2%	1,797,760	71.0% 2,531,875
1966	498,139	15.4%	386,663	11.9%	2,356,271	72.7% 3,241,073
1967	607,000	15.3%	323,459	8.2%	3,032,866	76.5% 3,963,325
1968	601,496	15.6%	331,462	8.6%	2,927,085	75.8% 3,860,043
1969	763,400	20.4%	265,363	7.1%	2,709,785	72.5% 3,738,548
1970	797,289	21.8%	282,989	7.7%	2,581,569	70.5% 3,661,847

<sup>a/</sup> Figures relate to a twelve-month period beginning in September for the designated year. They include dependency allowance to the extent known. October file data used for tabulation reference since 1963.

TABLE IV

Percentage and the Amount of Financial Aid for Fellowships  
and Assistantships per Enrolled Student by Area of Study a/  
1970-71

AREAS	FELLOWSHIPS PER ENROLLED STUDENT		ASSISTANTSHIPS PER ENROLLED STUDENT		FELLOWSHIPS PLUS ASSISTANTSHIPS PER ENROLLED STUDENT <u>f/</u>	
	Percentage	Amount <u>b/</u>	Percentage <u>c/</u>	Amount <u>b/</u>	Percentage	Amount <u>b/</u>
Physical Science <u>d/</u>	24.0 %	\$ 679	71.0 %	\$ 1,913	95.0 %	\$ 2,592
Engineering	11.1	313	56.0	1,651	67.1	1,964
Biological Sciences	21.2	625	57.6	1,764	78.8	2,389
Social Sciences	15.6	478	34.9	919	50.5	1,397
Humanities	15.4	471	50.3	1,504	65.7	1,975
Education <u>e/</u>	9.8	331	27.5	757	37.3	1,088
Fine and Applied Arts	8.6	217	45.9	920	54.5	1,137
ALL AREAS	15.1 %	\$ 452	46.4 %	\$ 1,285	61.5 %	\$ 1,737

a/ Calculated as of October, 1970; figures include University, industrial and endowed, State of Illinois, and federal fellowships, and assistantships supported from both University and contract and grant funds. Summer Fellowships for Teaching Assistants are not included.

b/ Amounts used for calculation do not include the monetary equivalent of tuition and fees which are waived, exempted, or paid by the sponsor.

c/ Assistantships are calculated on the basis of an unduplicated head count.

d/ Does not include NSF Mathematics Institute Fellowships.

e/ Enrollment upon which these figures are calculated includes a substantial number of students, such as public school teachers, who attend the University on a part-time basis and who are regularly employed off-campus.

f/ The combination of Fellowships and Assistantships percentage is not unduplicated.

TABLE V  
Amount of Financial Aid To Graduate Students a/  
1970-71

AREA	Fellowships <u>b/</u>			Amount of Aid		
	University	Industrial & Endowed	Federal & Other	Total	University	Other
Physical Sciences	\$ 160,200	\$ 80,260	\$ 524,642	\$ 765,102	\$ 1,336,665	\$ 819,835
Engineering	98,425	79,641	178,039	356,105	656,084	1,221,644
Biological Sciences	67,287	38,208	399,114	504,609	740,452	683,220
Social Sciences	189,050	53,340	728,210	970,600	1,509,455	354,963
Humanities	162,250	1,000	296,124	459,374	1,414,237	54,083
Education	37,777	10,470	432,040	480,287	933,658	166,116
Fine and Applied Arts	82,300	20,070	23,400	125,770	501,090	32,374
TOTAL	\$ 797,289	\$ 282,989	\$ 2,581,569	\$ 3,661,847	\$ 5,091,641	\$ 3,332,235
						\$10,423,876

a/ Tabulated as of October, 1970. Figures exclude Summer Fellowships for Teaching Assistants.

b/ Figures include dependency allowance to the extent known.

Table VI  
SUMMARY OF FELLOWS IN RESIDENCE  
1970-71

<u>TYPE OF FELLOWSHIP</u>	<u>Number</u>
I. Supported by University Funds	
A. University Fellows	190
B. Creative and Performing Arts	10
C. Illinois College Fellows	9
D. Dissertation Fellows	13
E. Graduate College Fellows	36
F. Other	31
	<u>Subtotal</u>
	289
II. Supported by Industries, Endowments, and Foundations	
A. Industries	73
B. Endowments	21
C. Woodrow Wilson Dissertation	8
D. Other Foundations	27
	<u>Subtotal</u>
	129
III. Supported by the State of Illinois	23
IV. Supported by U. S. Government	23
A. National Science Foundation	
1. Graduate Fellows	40
2. Trainees	128
3. Science Faculty Fellows	1
4. Mathematics Academic Year Institute	28
5. SIST Trainees	4
	<u>Subtotal</u>
	201
B. U. S. Department of Health, Education and Welfare	
1. Public Health Service	
a. Predoctoral Fellows	27
b. Trainees (UPHS 247, RSA 38, Child Bur. 2) <u>242</u>	
	<u>Subtotal</u>
	269
2. U. S. Office of Education	
a. Predoctoral Fellows	49
b. National Defense Education Act	
Title IV	105
Title VI	30
c. Higher Education Act of 1965	
Librarians	25

(Table VI cont.)

IV.

d. Education Professions Development Act:

Part E-Junior College Teachers in Mathematics	20
Part C-Early Childhood Education	4
Part C-Trainers of Teacher Trainers in English and Mathematics Education	24
Part C-Educational Psychology	4
Part F-Vocational and Technical Education	
Subtotal	<u>14</u>

275

C. Other U. S. Government

1. National Aeronautics and Space Administration Trainees	5
2. National Aeronautics and Space Administration International University Fellows	2
3. Atomic Energy Commission Fellows	11
4. Rehabilitation Service Administrative Trainees	35
5. Federal Water Pollution Control	10
6. Other	<u>18</u>
Subtotal	81

GRAND TOTAL, 1970-71 (as of October 1970)	1,267
GRAND TOTAL, 1969-70 (as of October 1969)	1,317
GRAND TOTAL, 1968-69 (as of October 1968)	1,341

Table VII

FELLOWSHIP OFFERS FOR 1971-72 a/

<u>Department</u>	<u>UNIVERSITY FELLOWSHIPS</u>	
	<u>Recommended by Department</u>	<u>Awarded</u>
Accountancy	9	2
Aeronautical & Astronautical Engineering	6	1
Agricultural Economics	5	2
Agricultural Engineering	3	1
Agronomy <u>b/</u>	5	5
Animal Science	3	0
Anthropology	8	5
Architecture	6	2
Art <u>b/</u>	5	5
Astronomy	3	2
Biochemistry <u>b/</u>	3	3
Biology	7	1
Botany	3	2
Business Administration (including Business Ph.D., Industrial Administration and Marketing)	8	1
Ceramic Engineering	3	1
Chemical Engineering <u>b/</u>	4	4
Chemical Physics <u>b/</u>	1	1
Chemistry <u>b/</u>	16	16
Civil Engineering <u>b/</u>	10	10
Classics	7	2
Comparative Literature	6	4
Computer Science	8	5
Communications (including Advertising, Communications, Ph.D., Journalism, and Radio-TV <u>b/</u> )	4	4
Dairy Science	2	0
Dance	2	1
Economics <u>b/</u>	4	4
Education <u>b/</u>	12	12
Electrical Engineering <u>b/</u>	9	9
English <u>b/</u>	12	12
Entomology	3	1

(Table VII cont.)

<u>Department</u>	<u>Recommended by Department</u>	<u>AWARDED</u>
Finance	2	0
Food Science (including Dairy Technology)	4	0
Forestry	2	2
French b/	5	5
Genetics	2	0
Geography	6	0
Geology b/	4	4
Germanic Languages & Literature	8	2
Health & Safety	0	0
History b/	6	6
Home Economics	2	1
Horticulture	2	0
Labor & Industrial Relations	4	0
Landscape Architecture	2	0
Law	7	1
Library Science	6	2
Linguistics	5	1
Mathematics b/	12	12
Mechanical & Industrial Engineering	7	1
Metallurgy and Mining Engineering	3	0
Microbiology	6	5
Music b/	10	10
Nuclear Engineering	6	3
Philosophy	7	0
Physical Education	3	0
Physics b/	13	13
Physiology & Biophysics	5	3
Plant Pathology	0	0
Political Science b/	4	4
Psychology b/	5	5
Recreation & Park Administration	1	1
Slavic Languages & Literatures	6	2
Social Sciences	0	0
Social Studies	2	0

(Table VII cont.)

<u>Department</u>	<u>UNIVERSITY FELLOWSHIPS</u>	
	<u>Recommended by Department</u>	<u>Awarded</u>
Social Work	8	3
Sociology	4	2
Spanish, Italian, & Portuguese b/	5	5
Speech	7	1
Theatre	4	1
Theoretical & Applied Mechanics	5	1
Urban Planning	3	0
Veterinary Medicine	2	0
Zoology	10	5
Center for Asian Studies	2	1
Center for Latin American Studies	2	1
Center for Russian Language Studies	<u>2</u>	<u>0</u>
TOTALS	388	221

a/ Figures tabulated as of April 16, 1971.

b/ Departments or units with fixed fellowship allocations. The numbers are the fixed allocations. Departments could nominate in excess of a fixed allocation by assuming financial responsibility for over-offers, or could re-offer declined awards to alternates.

In addition to the above awards, ten Creative and Performing Arts Fellowships have been awarded for 1971-72 as follows:

<u>Department</u>	<u>Awarded</u>
Architecture	1
Art	3
Dance	1
Landscape Architecture	1
Music	2
Theatre	1
Urban Planning	<u>1</u>
TOTAL	10

Table VIII

FUNDS ALLOCATED BY THE GRADUATE COLLEGE  
IN SUPPORT OF FELLOWSHIP PROGRAMS

Summer Fellowships for Teaching Assistants, 1971:	
80 at \$500	\$ 40,000
Faculty Summer Fellowships, 1971:	
60 at \$900	54,000
University Fellowships, 1970-71:	
25 at \$2,500 (contingency)	62,500
Optional Summer Fellowships for University Fellows, 1970-71: 200	100,000
University Dissertation Fellowships, 15 at \$3,550	53,200
Graduate College Fellowships, 1970-71:	
30 at \$2,500	75,000
	Subtotal
	\$ 384,700
Subventions to departments for most categories of graduate fellowships	339,336
Funds allocated to offset tuition and fee waivers in excess of Graduate College quota (estimated)	423,758
	Subtotal
	763,094
	GRAND TOTAL
	\$ 1,147,794

a/ The figures exclude the funds provided in the University budget for 200 University Fellowships and the value of tuition and fee waivers.

Table IX

FACULTY SUMMER FELLOWSHIPS

Urbana-Champaign Departments	1971 Applications Received	1971 Awards	1970 Awards
Anthropology	1	1	1
Architecture	3	2	1
Art	8	5	9
Astronomy	0	0	1
Botany	0	0	1
Center for Asian Studies	1	1	0
Center for Latin American Studies	0	0	1
Chemistry and Chemical Engineering	2	2	2
Classics	3	3	2
Dance	2	1	0
Economics	2	1	3
Electrical Engineering	1	1	0
English	22	16	11
Finance	3	1	2
French	1	0	1
Geography	0	0	1
Geology	2	2	2
Germanic Languages and Literatures	2	1	2
History	7	4	4
Journalism	0	0	1
Linguistics	1	1	0
Mathematics	2	2	1
Music	3	3	0
Philosophy	2	2	2
Physiology and Biophysics	2	2	1
Political Science	1	1	2
Psychology	1	1	2
Sociology	3	2	1
Spanish, Italian, and Portuguese	2	2	2
Speech	2	2	1
Theoretical and Applied Mechanics	<u>1</u>	<u>1</u>	<u>3</u>
TOTALS	80	60	60

TABLE X  
RESEARCH BOARD APPROPRIATIONS

July 1, 1970, through June 30, 1971

	<u>Amount Appropriated</u>	<u>Research Assistants FTE</u> <sup>a/</sup>
General University Purposes	\$ 888,732	
Humanities and Arts, Urbana	146,803	11.62
Social Sciences, Urbana	399,200	29.15
Education, Urbana	26,678	.89
Biological Sciences, Urbana	340,830	.97
Physical Sciences, Urbana	507,699	2.79
Total	\$2,309,942	45.42
 I. GENERAL UNIVERSITY PURPOSES		
Computer Services Operations	\$ 350,000	
Contributions on Behalf of the University	750	
Fellowships - Faculty	54,000	
Graduate Students	318,250	
Subvention	105,900	
Graduate College - Center for Advanced Study	120	
Children's Research Center	6,626	
Library	51,386	
Survey Research Laboratory	1,700	
Subtotal	\$ 888,732	
 II. HUMANITIES AND ARTS, URBANA		
Architecture	\$ 300	
Art	12,615	
Center for Asian Studies	6,754	.72
Classics	40,871	2.57
English	8,140	.97
French	13,780	1.90
Germanic Languages and Literatures	5,292	
Linguistics	6,594	.61
Music	40,944	4.18
Philosophy	650	
Slavic Languages and Literatures	2,250	
Spanish, Italian, and Portuguese	8,613	.67
Subtotal	\$ 146,803	11.62
 III. SOCIAL SCIENCES, URBANA		
Accountancy	3,100	
Advertising	1,200	
Agricultural Economics	4,100	

RESEARCH BOARD APPROPRIATIONS (Continued)  
July 1, 1970, through June 30, 1971

	<u>Amount Appropriated</u>	<u>Research Assistants FTE a/</u>
<b>III. SOCIAL SCIENCES, URBANA (Continued)</b>		
Anthropology	\$ 62,370	4.40
Business Administration	20,776	.16
Communications Research, Institute of	2,086	
Economics and Business Research, Bureau of	400	
Economics	27,444	3.25
Finance	5,675	.38
Geography	7,168	.61
History	36,881	5.87
Labor and Industrial Relations, Institute of	8,935	.47
Law	11,352	1.25
Library Science	2,000	
Political Science	14,821	.72
Psychology	156,664	9.83
Recreation and Park Administration	2,200	
Social Work, Jane Addams Graduate School of	2,200	.21
Sociology	26,328	2.00
Urban and Regional Planning	3,500	
<b>Subtotal</b>	<b>\$ 399,200</b>	<b>29.15</b>
<b>IV. EDUCATION, URBANA</b>		
Education	\$ 13,028	.63
Health and Safety Education	300	
Physical Education for Men	6,000	
Physical Education for Women	7,350	.26
<b>Subtotal</b>	<b>\$ 26,678</b>	<b>.89</b>
<b>V. BIOLOGICAL SCIENCES, URBANA</b>		
Agronomy	\$ 8,674	
Agricultural Experiment Station	4,000	
Animal Science	18,955	.25
Botany	48,758	.25
Dairy Science	6,250	
Entomology	5,069	
Food Science	42,975	
Home Economics	700	
Microbiology	100,542	.36
Physiology and Biophysics	49,170	
Veterinary Medicine	16,051	
Zoology	39,686	.11
<b>Subtotal</b>	<b>\$ 340,830</b>	<b>.97</b>
<b>VI. PHYSICAL SCIENCES, URBANA</b>		
Aeronautical and Astronautical Engineering	\$ 8,000	
Agricultural Engineering	1,320	

RESEARCH BOARD APPROPRIATIONS (Continued)  
July 1, 1970, through June 30, 1971

	<u>Amount Appropriated</u>	<u>Research Assistants FTE</u>	a/
VI. PHYSICAL SCIENCES, URBANA (Continued)			
Astronomy	\$ 3,000		
Aviation, Institute of	50,000		
Ceramic Engineering	10,500	.52	
Chemistry and Chemical Engineering	146,031	.12	
Civil Engineering	85,950		
Computer Science	58,500		
Coordinated Science Laboratory	4,605	.62	
Electrical Engineering	10,800		
Electron Microscope Facility	5,000	.52	
Engineering	25,000		
General Engineering	461		
Geology	5,400		
Mathematics	5,315	.37	
Mechanical and Industrial Engineering	14,001	.64	
Metallurgy and Mining Engineering	26,010		
Nuclear Engineering	9,650		
Physics	28,156		
State Water Survey	3,000		
Theoretical and Applied Mechanics	7,000		
Subtotal	\$ 507,699		2.79

a/ Salaries are included in the amounts shown in the dollar column.

TABLE XI

STATISTICAL SUMMARY OF APPLICATIONS FOR GRANTS  
AND CONTRACTS SENT TO AGENCIES OUTSIDE THE UNIVERSITY  
URBANA-CHAMPAIGN CAMPUS

Data on Applications Transmitted from July 1, 1970, through June 30, 1971

APPLICATIONS SUBMITTED			APPLICATIONS ACTED ON (as of June 30, 1971)			APPLICATIONS PENDING (as of June 30, 1971)		
<u>Area</u>	<u>No.</u>	<u>Amount Requested</u>	<u>Supported in whole or in part</u>	<u>Amount Received</u>	<u>Denied</u>	<u>Amount Requested</u>	<u>No.</u>	<u>Amount Requested</u>
Administration	47	\$ 7,591,880	23	\$ 6,423,628	\$ 1,647,644	4	\$ 166,409	20 \$ 1,001,843
Humanities	28	872,119	14	211,617	201,314	4	39,486	10 621,016
Arts	15	609,548	5	11,972	11,972	1	14,833	9 582,743
Social Sciences	113	4,874,406	44	1,055,806	949,620	14	596,424	55 3,222,176
Social Sciences Applied	65	2,488,025	33	812,319	698,089	5	105,182	27 1,570,524
Education	110	10,280,325	38	1,150,763	1,099,684	13	746,686	59 8,382,876
Biological Sciences	110	12,109,865	45	1,617,565	1,423,252	11	612,014	54 9,880,286
Biological Sciences Applied	293	7,896,183	218	2,136,031	1,999,182	9	448,957	66 5,311,195
Physical Sciences	199	12,922,148	99	3,289,009	2,446,429	19	2,188,006	81 7,445,133
Physical Sciences Pure	412	33,006,948	192	5,021,736	3,823,149	56	4,738,362	164 23,246,850
TOTALS	1392	\$ 92,651,447	711	\$ 21,730,446	\$ 14,300,335	136	\$ 9,656,359	545 \$ 61,264,642

TABLE XII

STATISTICAL SUMMARY OF APPLICATIONS FOR GRANTS  
AND CONTRACTS SENT TO AGENCIES OUTSIDE THE UNIVERSITY  
URBANA-CHAMPAIGN CAMPUS

Data on Applications Transmitted from July 1, 1969, through June 30, 1970

APPLICATIONS SUBMITTED		APPLICATIONS ACTED ON (as of June 30, 1971)						APPLICATIONS PENDING (as of June 30, 1971)					
Area	No.	Supported in whole or in part			Denied			Amount Requested	Amount Received	No.	Amount Requested	No.	Amount Requested
		Amount Requested	No.	Amount Requested	No.	Amount Received	No.						
Administration	56	\$16,553,465	40	\$13,591,791	\$ 3,101,552	11	\$ 1,114,663			5	\$1,847,011		
Humanities	24	1,104,998	18	634,822	567,583	3	112,147			3	358,029		
Arts	21	163,633	15	60,683	60,369	4	53,323			2	49,627		
Social Sciences	127	4,204,359	77	2,853,392	2,436,334	41	1,040,034			9	310,933		
Pure													
Social Sciences Applied	90	3,429,003	67	2,241,225	1,697,539	16	864,311			7	323,467		
Education	87	10,408,732	57	6,973,248	3,182,103	22	2,980,177			8	455,307		
Biological Sciences	110	4,982,027	77	3,010,805	2,208,825	23	1,227,476			10	743,746		
Pure													
Biological Sciences Applied	234	7,893,214	182	3,295,792	2,738,208	42	2,444,626			10	2,152,796		
Physical Sciences	195	11,566,592	147	8,108,654	5,131,278	38	2,623,913			10	834,025		
Pure													
Physical Sciences Applied	360	20,687,416	250	13,004,116	10,973,038	90	5,665,871			20	2,017,429		
TOTALS	1304	\$80,993,439	930	\$53,774,528	\$32,096,829	290	\$18,126,541			84	\$9,092,370		

TABLE XIII  
ENROLLMENT BY FIELD OF STUDY  
1970-71 -- 1967-68

Field of Study	1970-71	1969-70	1968-69	1967-68
<b>AGRICULTURE</b>				
Agricultural Economics	105	106	93	91
Agricultural Education	26	34	34	34
Agricultural Engineering	31	29	28	26
Agronomy	100	98	98	102
Animal Science	66	57	66	68
Dairy Science	25	35	44	42
Food Science	51	55	59	56
Dairy Technology	3	4	5	7
Forestry	20	18	19	11
Home Economics	88	86	77	66
Home Economics Education	3	3	4	1
Horticulture	29	27	21	18
Plant Pathology	38	36	35	42
Subtotal	585	588	583	564
<b>COMMERCE AND BUSINESS ADMINISTRATION</b>				
Accountancy	108	110	113	91
Accounting Science	25	27	30	44
Business	42	42	33	31
Business Administration	230	234	177	163
Commercial Teaching	0	0	2	4
Management	0	3	10	18
Marketing	36	32	42	47
Economics	206	196	197	186
Finance	79	75	67	54
Subtotal	726	719	671	638
EDUCATION	2403	2341	2230	2146
<b>ENGINEERING</b>				
Aeronautical and Astronautical Engineering	48	52	53	65
Ceramic Engineering	34	32	26	34
Ceramics	1	1	0	0
Chemical Physics	17	6	4	1
Civil Engineering	349	308	306	330
Environmental Engineering a/	38	31	29	24
Computer Science	162	158	134	73
Electrical Engineering	326	317	326	314
Mechanical Engineering	120	120	113	115
Industrial Engineering	22	20	19	b/

TABLE XIII (continued)

ENROLLMENT BY FIELD OF STUDY  
1970-71 -- 1967-68

Field of Study	1970-71	1969-70	1968-69	1967-68
ENGINEERING (Continued)				
Metallurgical Engineering	57	64	64	65
Mining Engineering	5	9	10	15
Nuclear Engineering	71	70	71	76
Physics	339	354	360	348
Teaching of Physics	0	0	0	0
Theoretical and Applied Mechanics	<u>69</u>	<u>85</u>	<u>79</u>	<u>84</u>
Subtotal	1658	1627	1594	1544
FINE AND APPLIED ARTS				
Architecture	56	56	42	29
Architectural Engineering	32	20	16	22
Art	93	92	79	74
Art Education	50	53	37	37
Dance d/	26	7	7	(7)
Landscape Architecture	21	16	17	24
Music	278	245	285	247
Music Education	203	225	231	240
Theatre	49	53	23	0
Urban Planning	<u>53</u>	<u>50</u>	<u>36</u>	<u>31</u>
Subtotal	861	817	773	704
COMMUNICATIONS				
Advertising	76	84	70	61
Communications	51	56	56	58
Journalism	52	47	39	36
Radio and Television	31	31	31	22
Television	<u>1</u>	<u>3</u>	<u>4</u>	<u>2</u>
Subtotal	211	221	200	179
LAW				
Law	39	44	41	28
Comparative Law	<u>4</u>	<u>5</u>	<u>0</u>	<u>0</u>
Subtotal	43	49	41	28
LIBERAL ARTS AND SCIENCES				
Anthropology	115	111	100	96
Astronomy	28	26	25	24
Biochemistry	59	b/	b/	b/
Biology	76	66	52	44
Teaching of Biological Sciences and General Science	42	54	44	40

TABLE XIII (continued)

ENROLLMENT BY FIELD OF STUDY

1970-71 -- 1967-68

Field of Study	1970-71	1969-70	1968-69	1967-68
<b>LIBERAL ARTS AND SCIENCES (Continued)</b>				
Biophysics	23	24	21	30
Botany	42	48	54	53
Chemistry	347	415	407	395
Chemical Engineering	64	67	70	76
Teaching of Chemistry	1	2	6	1
Classics	17	17	26	25
Classical Philology	16	14	7	6
Greek	1	2	2	1
Latin	14	13	14	3
Teaching of Latin	1	1	1	0
Comparative Literature	44	45	41	44
English	341	363	384	359
Teaching of English	40	32	37	30
Teaching of English as a Second Language	62	59	41	22
Entomology	54	52	55	55
French	96	105	102	95
Teaching of French	50	33	20	14
Genetics	8	9	9	4
Geography	73	75	69	61
Teaching of Geography	3	4	2	6
Geology	88	91	82	76
German	72	73	60	62
Teaching of German	5	3	2	8
History	263	287	254	239
Linguistics	61	63	62	57
Mathematics	417	454	489	506
Statistics	15	10	8	9
Teaching of Mathematics	63	52	45	45
Microbiology	79	74	73	61
Nutritional Science	22	21	2	b/
Philosophy	53	61	60	65
Physical Sciences	0	1	1	1
Teaching of Physical Sciences	0	0	1	2
Physiology	73	74	73	79
Political Science	145	156	147	127
Public Administration	19	19	9	6
Psychology	236	220	221	242
Clinical Psychology	34	53	42	17
Russian	63	75	62	41
Teaching of Russian	2	0	0	0
Social Sciences	30	37	35	26
Teaching of Social Sciences	66	69	62	46
Sociology	111	111	108	102

TABLE XIII (continued)

ENROLLMENT BY FIELD OF STUDY

1970-71 -- 1967-68

Field of Study	1970-71	1969-70	1968-69	1967-68
<b>LIBERAL ARTS AND SCIENCES (Continued)</b>				
Spanish	127	146	140	135
Italian	7	5	4	4
Portuguese	9	9	6	5
Teaching of Spanish	3	7	8	3
Speech c/	211	186	199	189
Speech Correction	19	27	23	19
Teaching of Speech	9	10	8	4
Teaching of Earth Sciences	2	b/	b/	b/
Zoology	<u>107</u>	<u>108</u>	<u>98</u>	<u>118</u>
Subtotal	4028	4139	3973	3778
<b>PHYSICAL EDUCATION</b>				
Dance d/	d/	d/	d/	7
Health Education	39	39	29	23
Physical Education	130	135	137	142
Teaching of Physical Education	9	3	3	4
Recreation	<u>106</u>	<u>84</u>	<u>65</u>	<u>64</u>
Subtotal	284	261	234	240
<b>OTHER</b>				
Extension Education	26	23	24	16
Labor and Industrial Relations	92	78	71	76
Library Science	301	305	305	309
Social Work	161	138	121	88
Veterinary Medical Science	<u>56</u>	<u>60</u>	<u>53</u>	<u>57</u>
Subtotal	636	604	574	546
UNCLASSIFIED	1559	1758	1667	1433
CIC TRAVELING SCHOLARS	<u>7</u>	<u>6</u>	<u>5</u>	<u>4</u>
TOTAL	13,001	13,130	12,545	11,804

a/ Formerly Sanitary Engineering.

b/ Program not offered.

c/ Speech and Theatre became separate departments in 1968.

d/ Transferred from College of Physical Education to College of Fine and Applied Arts in 1968.

TABLE XIV  
DEGREES CONFERRED BY FIELD OF STUDY  
1970-71 -- 1968-69

Field of Study	Ph.D.			A.M. and M.S.		
	1970-71	1969-70	1968-69	1970-71	1969-70	1968-69
Accountancy	5	8	15	1	0	0
Advertising			a/	36	44	17
Aeronautical and Astronautical Engineering						
Aeronautical Engineering	7	7	8	10	9	7
Agricultural Economics	11	10	12	15	24	14
Agricultural Education			a/	8	5	3
Agricultural Engineering	2	6	3	3	5	4
Agronomy	13	21	19	17	6	13
Animal Science	13	4	6	13	8	10
Anthropology	6	7	5	16	7	9
Architectural Engineering			a/	20	7	11
Art Education			a/	19	16	12
Art History	0	0	0	0	4	8
Astronomy	2	2	3	5	4	8
Biochemistry	3			10	0	0
Biology	9	7	3	5	5	4
Biophysics	5	4	6	2	0	1
Botany	4	5	10	7	11	6
Business	3	5	4			a/
Ceramic Engineering	5	2	6	3	4	6
Ceramics	0	0	0	0	0	0
Chemical Engineering	14	18	8	13	11	23
Chemical Physics	1	0	1	0	0	0
Chemistry	50	87	69	41	51	40
Civil Engineering	31	30	20	101	98	92
Classical Philology	1	1	2			a/
Classics			a/	3	4	3
Commercial Teaching			a/			1
Communications	4	12	13			a/
Comparative Literature	0	3	4	8	4	6
Computer Science	8	4	0	22	28	27
Dairy Science	5	6	4	4	5	13
Dairy Technology	1	0	0	0	0	0
Dance			a/	3	6	1
Economics	13	13	13	26	29	58
Education	70	25	28	27	25	22
Electrical Engineering	31	33	40	65	85	75
English	30	17	23	57	63	83
Entomology	6	11	5	4	6	2
Finance	8	3	3	10	18	14
Food Science	16	7	9	7	6	10
Forestry			a/	8	7	9
French	6	5	4	16	20	20
Genetics	2	1	0			a/
Geography	7	4	2	8	6	8

TABLE XIV (continued)

DEGREES CONFERRED BY FIELD OF STUDY  
1970-71 -- 1968-69

Field of Study	Ph.D.			A.M. and M.S.		
	1970-71	1969-70	1968-69	1970-71	1969-70	1968-69
Geology	8	13	9	9	10	8
German	7	3	3	7	11	7
Greek			a/	0	0	2
Health Education			a/	12	9	9
History	13	9	14	61	37	44
Home Economics	1	0	0	28	31	21
Home Economics Education			a/	0	1	0
Horticulture	3	0	1	3	4	4
Industrial Engineering			a/	5	7	1
Italian	0	0	0	0	0	3
Journalism			a/	12	16	14
Labor and Industrial Relations	1	1	0	29	24	30
Latin			a/	9	2	5
Library Science	3	9	3	121	114	109
Linguistics	2	9	3	11	4	9
Management			a/	1	3	7
Marketing	3	2	6	3	8	11
Mathematics	29	28	26	91	120	121
Mechanical Engineering	11	17	6	32	26	24
Metallurgical Engineering	11	14	4	8	9	11
Microbiology	5	8	12	15	15	15
Mining Engineering	1	4	0	2	1	4
Music Education			a/	55	60	78
Musicology	2	3	1			a/
Nuclear Engineering	7	7	7	13	14	23
Nutritional Sciences	5	6	2	0	2	1
Philosophy	2	9	3	8	9	3
Physical Education	20	24	15	25	23	22
Physical Sciences			a/	0		0
Physics	50	40	37	81	69	72
Physiology	20	9	12	9	12	14
Plant Pathology	9	5	7	5	4	5
Political Science	13	6	7	34	22	34
Portuguese	1	1	1	2	2	3
Psychology	50	44	35	27	30	39
Public Administration			a/	3	6	0
Radio and Television			a/	1	7	4
Recreation			a/	28	24	19
Russian	5	0	0	5	15	2
Sanitary Engineering	1	2	0	5b/	8	10
Social Sciences			a/	10	10	13
Sociology	17	6	3	28	24	26
Spanish	11	12	8	16	17	28
Speech c/	20	11	14	60	42	51
Speech Correction			a/	3	8	4

TABLE XIV (continued)

## DEGREES CONFERRED BY FIELD OF STUDY

1970-71 --- 1968-69

Field of Study	Ph.D.			A.M. and M.S.		
	1970-71	1969-70	1968-69	1970-71	1969-70	1968-69
Statistics	0	1	1	11	5	3
Teaching of Biological and General Science			a/	15	16	15
Teaching of Chemistry			a/	1	0	5
Teaching of Earth Science				1	0	0
Teaching of English			a/	18	16	23
Teaching of English as a Second Language			a/	24	16	11
Teaching of French			a/	23	11	7
Teaching of Geography			a/	2	1	2
Teaching of German			a/	1	1	0
Teaching of Latin			a/	1	0	0
Teaching of Mathematics			a/	24	15	20
Teaching of Physical Education			a/	2	3	3
Teaching of Physical Sciences			a/	0	1	1
Teaching of Physics			a/	0	0	0
Teaching of Russian			a/	2	0	0
Teaching of Social Studies			a/	27	27	11
Teaching of Spanish			a/	3	1	0
Teaching of Speech			a/	2	6	3
Theatre			a/	22	23	4
Theoretical and Applied Mechanics	5	15	16	15	24	18
Veterinary Medical Science	7	10	11	4	4	9
Zoology	14	10	7	12	9	29
TOTAL	749	705	622	1710	1675	1714

a/ Degree not offered.b/ Two of these degrees were granted under the new rubric "Environmental Engineering in Civil Engineering."c/ Speech and Theatre became separate departments in 1968.

TABLE XV

PROFESSIONAL DEGREES CONFERRED BY FIELD OF STUDY  
1970-71 -- 1968-69

Field of Study	1970-71	1969-70	1968-69
Doctor of Business Administration	1	0	0
Doctor of Education in			
Education	52	56	53
Music Education	7	4	6
Art Education	1	0	0
Doctor of Musical Arts	14	12	6
Doctor of Psychology	1	0	0
Doctor of the Science of Law	1	0	0
Advanced Certificate in			
Education	54	61	72
Music Education	1	4	3
Certificate of Advanced Study in			
Librarianship	6	5	12
Master of Accounting Science	28	43	31
Master of Architecture	24	24	14
Master of Business Administration	60	34	53
Master of Commerce	6	10	7
Master of Comparative Law	4	3	3
Master of Education	482	570	553
Master of Extension Education	9	5	10
Master of Fine Arts in			
Design	7	19	6
Painting and Printmaking	3		6
Sculpture	3	0	3
Master of Landscape Architecture	7	8	6
Master of Laws	3	1	3
Master of Music	47	45	52
Master of Social Work	72	153	133
Master of Television	0	2	8
Master of Urban Planning	22	20	16
TOTAL	915	1007 1079	1056

APPENDIX B

UNIVERSITY PRESS PUBLICATIONS<sup>a/</sup>  
May 1, 1970 to May 1, 1971

Illinois Studies Series

(Books Published)

Levine and Ivens: The Coccidian Parasites of Ruminants BM 44

(Books in Process)

Bowen: The Age of Bluff: Paradox and Ambiguity in Rabelais and Montaigne  
LL 62  
Ross and Ricker: The Classification, Evolution, and Dispersal of the  
Winter Stonefly Genus Allocapnia BM 45  
Willis: Latin Textual Criticism LL 61  
Young: Ngawbe: Tradition and Change Among the Western Guaymi of Panama  
An 7

Illini Books

(Books Published)

IB-64 Dupuis, editor: Nature, Aims, and Policy (Readings in the  
Philosophy of Education)  
IB-65 Smith, editor: Theories of Value and Problems of Education  
IB-66 McCue, et al.: Creating the Human Environment  
IB-67 Harper: History Is Your Own Heartbeat  
IB-70 Klemke, editor: Essays on Bertrand Russell  
IB-71 Davis: Discretionary Justice  
IB-72 Berwanger: Frontier Against Slavery  
IB-68 Hoffmeister: Mammals of Grand Canyon  
IB-69 Klemke, editor: Essays on Wittgenstein  
IB-73 Lane, editor: The Debate Over Slavery: Stanley Elkins and His  
Critics  
IB-74 Peltason: Fifty-Eight Lonely Men: Southern Federal Judges and  
School Desegregation  
IB-75 Smith, R., editor: Aesthetics and Problems of Education  
IB-76 Levit, editor: Curriculum  
IB-77 Simon: Lincoln's Preparation for Greatness

Non-Serial Publications

(Books Published)

Aldridge, editor: The Ibero-American Enlightenment  
Armstrong: The Affecting Presence: An Essay in Humanistic Anthropology  
Brandabur: A Scrupulous Meanness: A Study of Joyce's Early Work  
Buford, editor: Essays on Other Minds  
Bussell et al.: MERMAC Manual  
Curley: In the Hands of Our Enemies

Non-Serial Publications (Continued)

(Books in Process)

- Blum: Basic Books in the Mass Media  
Callahan: The Connotations of History  
Campbell: Maryland in Africa: The Maryland State Colonization Society, 1831-1857  
Catanese: Scientific Methods of Urban Analysis  
Denisoff: Great Day Coming: Folk Music and the American Left  
Franciscono: Walter Gropius and the Bauhaus  
Garber: Wordsworth and the Poetry of Encounter  
Gatewood, editor: Smoked Yankees and the Struggle for Empire: Letters from Negro Soldiers, 1898-1902  
Green: Only a Miner: Studies in Recorded Coal Songs  
Haller: Outcasts from Evolution: Scientific Attitudes of Racial Inferiority, 1859-1900  
Harlan, editor: The Booker T. Washington Papers, Vol. I  
Hoffmeister: Mammals of Grand Canyon  
Johnson: From Riot to Reason  
Johnson and Johanningmeier: Teachers for the Prairie: The University of Illinois and the Schools, 1868-1945  
Jordan: Gibbon and His Roman Empire  
Kang: Sumerian Economic Texts from the Drehem Archive  
Kirk: Psycholinguistic Learning Disabilities  
Klemke, editor: Essays on Wittgenstein  
Lane, editor: The Debate Over Slavery: Stanley Elkins and His Critics  
Lavatelli, editor: Language Training in Early Childhood Education  
Levit, editor: Curriculum  
Lowitt: George W. Norris: The Persistence of a Progressive, 1913-1933  
Lukic: Contemporary Yugoslav Literature  
McGeehan: The German Rearmament Question  
McMillen: The Citizens' Council: Organized Resistance to the Second Reconstruction, 1954-1964  
Marras, editor: Intentionality, Mind, and Language  
Merritt, editor: Communication in International Politics  
Morton, editor: Biological and Social Factors in Psycholinguistics  
Plath, editor: Aware of Utopia  
Richardson: Modern Art and Scientific Thought  
Ringer, editor: Yearbook of the International Folk Music Council, Vol. II, 1970  
Samuels: The Ambiguity of Henry James  
Schneider: The Ethos of Restoration Comedy  
Schramm and Roberts, editors: Process and Effects of Mass Communications, revised second edition  
Shapiro: Leadership of the American Zionist Organization, 1897-1930  
Sloan, editor: Wright's "Passions of the Minde"  
Smith, R., editor: Aesthetics and Problems of Education  
Stillinger: The Hoodwinking of Madeline and Other Essays on Keats's Poems  
Tarr: A Study in Boss Politics: The Career of Chicago's Blond Boss, William Lorimer  
Tesconi and Morris: The Anti-Man Culture: A Study of Bureau-technocracy and the Schools

Non-Serial Publications (Continued)

(Books Published)

- Derber: The American Idea of Industrial Democracy, 1865-1965  
Ewan: John Banister and His Natural History of Virginia, 1678-1692  
Friedman: And If Defeated Allege Fraud  
George: One Woman's Situation: A Study of Mary Wollstonecraft  
Gordon: Parent Involvement in Compensatory Education  
Harper: History Is Your Own Heartbeat  
Jackson and Spence, editors: The Expeditions of John Charles Frémont,  
Vol. I, Travels from 1838 to 1844, and Map Portfolio  
Jerome: Plays for an Imaginary Theater  
Klemke, editor: Essays on Bertrand Russell  
Kress: The Idea of Process: The Ambiguous Legacy of Arthur F. Bentley  
Lott: Language and Psychology in Pepita Jiménez  
McCue et al.: Creating the Human Environment  
McDermott, editor: Travelers on the Western Frontier  
Millar, editor: The Soviet Rural Community: A Symposium  
Moores: Fields of Rich Toil  
Moss: Dreams, Images and Fantasy  
Moss and James: "Black Rover, Come Over!"  
Pinkett: Gifford Pinchot: Private and Public Forester  
Porter and Johnson: National Party Platforms, 1840-1968  
Ringer, editor: Yearbook of the International Folk Music Council,  
Vol. I, 1969  
Schiller and Phillips, editors: Super-State: Readings on the Military-  
Industrial Complex  
Schleunes: The Twisted Road to Auschwitz: Nazi Policy Toward German  
Jews, 1933-1939  
Schumer and Nyhus, editors: Corticosteroids in the Treatment of Shock  
Schwarz: The Interregnum of Despair: Hoover, Congress, and the  
Depression  
Scott: The Reluctant Farmer: The Rise of Agricultural Extension to  
1914  
Shapiro and Wadsworth: The Comedy of Eros: Medieval French Guides To  
the Art of Love  
Simon: Issues on the Economics of Advertising  
Smith, B. O., and Meux: A Study of the Logic of Teaching  
Smith, R., editor: Aesthetic Concepts and Education  
Smith, P., editor: Theories of Value and Problems of Education  
Stearns: Science in the British Colonies of America  
Stern: The Golden Moment: The Novels of F. Scott Fitzgerald  
Stubbs: The Pursuit of Form: A Study of Hawthorne and the Romance  
Tunstall, editor: Media Sociology  
Winters: Henry Cantwell Wallace as Secretary of Agriculture, 1921-1924  
Wulbern: Brecht and Ionesco: Commitment in Context

(Books in Process)

- Bernard: Jesuits and Jacobins: Enlightenment and Enlightened Despotism  
in Austria  
Blassingame, editor: New Perspectives on Black Studies

Non-Serial Publications (Continued)

(Books in Process)

Thackrey: The Future of the State University  
Tikku, editor: Islam and Its Cultural Divergence  
Turyn: Dated Greek Manuscripts of the Thirteenth and Fourteenth  
Centuries in the Libraries of Italy, Vol. I and Vol. II  
Watts: Hemingway and the Arts

Journals

(Four Issues Each)

The American Journal of Psychology  
Comparative Literature Studies  
Illinois Journal of Mathematics  
The Journal of Aesthetic Education  
Journal of English and Germanic Philology  
Library Trends  
Quarterly Digest of Urban and Regional Research

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